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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/811,432

Applicant(s)

RENSBURG ET AL.

Examiner

MATTHEW SAMS

Art Unit

2617

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 March 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6, 8, 10, 14-21, 23, 25, 29-35 and 40-47 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 10, 14-21, 23, 25, 29-35 and 40-47 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment

1. This office action has been changed in response to the amendment filed on 3/23/2009.
2. Claims 1, 6, 16, 21, 31 and 35 have been amended. Claims 7 and 22 have been canceled.

Response to Arguments

3. Applicant's arguments with respect to claims 1-6, 8, 10, 14-21, 23, 25, 29-35 and 40-47 have been considered but are moot in view of the new ground(s) of rejection.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-3, 5, 6, 10, 14-18, 20-21, 25, 29-32, 34, 35 and 40-47 rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer et al. (US 2002/0146983 hereinafter, Scherzer) in view of Judson (US-7,054,662).

Regarding claim 1, Scherzer teaches a base station (Fig. 1 [110]) capable of serving multiple mobile stations (Fig. 1 [121, 122 & 123]) in a wireless network, the base station comprising:

a transceiver (Page 1 [0007] and Fig. 1 [110]) operable to receive from a select one of the multiple mobile stations (Fig. 1 [121-123]) a value of a first pilot strength signal and a value of a second pilot strength signal over a beam update time (Page 15 [0138] "mobile unit providing a pilot measurement message, for power level control" and operating "with this feedback information in determining beam characteristics" and Page 9 [0077] *i.e.* using the pilot channel for phase mismatches with the traffic channel) and multiple power control signals during said beam update time; (Page 9 [0078] "measuring a current beam configuration link, selecting another beam configuration, measuring the selected beam configuration link, and comparing the current and selected beam configuration results" *i.e.* differential calculations) and

beam forming circuitry (Page 8 [0072]) operable to calculate a differential pilot strength corresponding to a difference between a value of said first pilot strength signal and a value of said second pilot strength signal (Page 15 [0138] "mobile unit providing a pilot measurement message, for power level control" and operating "with this feedback information in determining beam characteristics" and Page 9 [0077] *i.e.* using the pilot channel for phase mismatches with the traffic channel), to calculate a differential power control corresponding to two or more of said multiple power control signals, and to form a downlink traffic beam spatially directed to serve said select one of said multiple mobile stations, (Fig. 1 [111-113]) said downlink traffic beam having a beam width set as a function of said differential pilot strength and said differential power control (Page 9 [0077] "the channel characteristic information may indicate that a phase mismatch exists between the pilot channel and the traffic channel or that a decrease in traffic channel

signal level to interference is experienced associated with the narrowing of the antenna beam” and “processing proceeds to step 312 where the beam configuration index may be backed off one or more steps in the beam hierarchy to select a previous or less aggressive beam configuration”, Page 7 [0058 & 0060-0061] & Pages 8-9 [0072-0076] for reference about the process of narrowing/optimizing antenna beams), wherein said function comprises an algorithm that uses at least two possible beam widths (Page 9 [0076-0077] *i.e.* trying different traffic channel beam widths to determine if one configuration is a threshold better than the other), and wherein the function generates a value that indicates if the beam width should be increased, decreased, or remain the same. (Page 9 [0076] “determine if the more aggressive beam configuration provides some threshold level of improvement” *i.e.* decrease the beam width and [0077] “select a previous or less aggressive beam configuration” *i.e.* increase the beam width, “determine if that configuration is or remains a best choice” *i.e.* stay the same)

Scherzer differs from the claimed invention by not explicitly reciting each of said power control signals requests said base station to one of increase the power of a traffic signal and decrease the power of said traffic signal.

In an analogous art, Judson teaches a system for forward link beam forming in a CDMA cellular communication system (Col. 3 lines 33-61 and Col. 4 lines 40-67) that includes receiving beam updates (Col. 6 line 15 through Col. 7 line 18, Col. 8 lines 11-25 and Fig. 3) less frequently than the power control updates, (Col. 5 lines 54-57), wherein the power control signals request the base station to one of increase the power of a traffic signal and decrease the power of said traffic signal. (Col. 2 lines 16-26 and

Col. 6 lines 7-12) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to be motivated to implement the wireless network of Scherzer after modifying it to include the power control updates of Judson since using power control enables keeping power transmitted to each user at a minimum level needed to maintain a reliable communication link in order to minimize interference between mobile devices and thereby increasing cell capacity. (Judson Col. 2 lines 3-13)

Regarding claim 2, Scherzer in view of Judson teaches an adaptive antenna array connected to said beam forming circuitry (Scherzer Page 8 [0072]) to facilitate forming of said downlink beam by said beam forming circuitry. (Scherzer Page 1 [0009])

Regarding claim 3, Scherzer in view of Judson teaches said beam forming circuitry comprises traffic beam forming circuitry operable to form said downlink traffic beam and pilot beam forming circuitry operable to form a pilot beam serving said multiple mobile stations. (Scherzer Page 9 [0077])

Regarding claim 5, Scherzer in view of Judson teaches the pilot beam carries a pilot signal for use by multiple mobile stations and the pilot strength signal is generated by one of the mobile stations in response to the pilot signal received by one of the mobile stations. (Scherzer Page 1 [0009] and Page 15 [0138] and Page 16 [0139-0140])

Regarding claim 6, Scherzer in view of Judson teaches the traffic beam carries said traffic signal, said traffic signal associated with one of the multiple mobile stations

(Scherzer Page 9 [0074] "reading of channel characteristic information associated with use of this alternative beam configuration with the selected mobile unit") and the power control signal is generated by one of the multiple mobile stations in response to the traffic signal received by one of the multiple mobile stations. (Scherzer Page 2 [0013], Pages 4-5 [0043] "received signal strength", Page 7 [0061] & Page 15 [0139])

Regarding claim 10, Scherzer in view of Judson teaches a system for forward link beam forming in a CDMA cellular communication system (Judson Col. 3 lines 33-61 and Col. 4 lines 40-67) that includes receiving beam updates (Judson Col. 6 line 15 through Col. 7 line 18, Col. 8 lines 11-25 and Fig. 3) less frequently than the power control updates, (Judson Col. 5 lines 54-57) wherein the power control signals are received every 1.25 msec (Judson Col. 5 lines 54-57) and the beam update time is 100 msec. (Judson Col. 8 lines 11-25)

Regarding claim 14, Scherzer in view of Judson teaches the beam forming circuitry (Scherzer Page 8 [0072]) is further operable to decrease the beam width of said traffic beam according to the differential power control signal. (Scherzer Page 9 [0078] *i.e.* "measure several iterations of implementation of a particular beam configuration", "comparing the current and selected beam configuration results" and [0076] "the less aggressive beam configuration (here a power level associated with the less aggressive beam determined from multiplying the beam configuration and the corresponding set point information) is subtracted from channel characteristic information associated with the more aggressive beam configuration (here a power level associated with the more aggressive beam determined from multiplying the beam

configuration and the corresponding set point information) to determine if the more aggressive beam configuration provides some threshold level of improvement")

Regarding claim 15, Scherzer in view of Judson teaches the beam forming circuitry (Scherzer Page 8 [0072]) is further operable to increase or decrease the beam width of said traffic beam according to the values of the differential power control and the differential pilot strength signal. (Scherzer Page 9 [0076-0078], specifically [0077] "the channel characteristic information may indicate that a phase mismatch exists between the pilot channel and the traffic channel" which was caused by "the narrowing of the antenna beam")

Regarding claim 16, the limitations of claim 16 are rejected as being the same reason set forth above in claim 1.

Regarding claim 17, the limitations of claim 17 are rejected as being the same reason set forth above in claim 2.

Regarding claim 18, the limitations of claim 18 are rejected as being the same reason set forth above in claim 3.

Regarding claim 20, the limitations of claim 20 are rejected as being the same reason set forth above in claim 5.

Regarding claim 21, the limitations of claim 21 are rejected as being the same reason set forth above in claim 6.

Regarding claim 25, the limitations of claim 25 are rejected as being the same reason set forth above in claim 10.

Regarding claim 29, the limitations of claim 29 are rejected as being the same reason set forth above in claim 14.

Regarding claim 30, the limitations of claim 30 are rejected as being the same reason set forth above in claim 15.

Regarding claim 31, the limitations of claim 31 are rejected as being the same reason set forth above in claim 1.

Regarding claim 32, the limitations of claim 32 are rejected as being the same reason set forth above in claim 2.

Regarding claim 34, the limitations of claim 34 are rejected as being the same reason set forth above in claim 5.

Regarding claim 35, the limitations of claim 35 are rejected as being the same reason set forth above in claim 6.

Regarding claim 40, the limitations of claim 40 are rejected as being the same reason set forth above in claim 14.

Regarding claim 41, the limitations of claim 41 are rejected as being the same reason set forth above in claim 15.

Regarding claims 42, 44 and 46, Scherzer in view of Judson teaches differential power control is calculated corresponding to a cumulative value of all of said multiple power control signals. (Scherzer Pages 6-7 [0053-0054] "average transmission power" inherently requires summing together more than one transmission power value)

Regarding claims 43, 45 and 47, Scherzer in view of Judson teaches said differential power control is calculated corresponding to a difference between a value of

a first one of said power control signals and a value of a second one of said power control signals. (Scherzer Para [0076])

6. Claims 4, 19 and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer in view of Judson as applied to claims 3, 18 and 31 above, and further in view of Scherzer et al. (US-6,895,258).

Regarding claim 4, Scherzer in view of Judson teaches the limitations of claims 3, 18 and 31 above, but differs from the claimed invention by not explicitly reciting the pilot beam width is wider than the traffic beam.

In an analogous art, Scherzer et al. teaches a space division multiple access system and method for use in cellular telecommunications (Col. 3 lines 29-56) that incorporating beam forming (Col. 6 lines 13-17), beam width adjustment (Col. 4 lines 8-9), power control feedback (Col. 7 lines 60-65, Col. 8 lines 37-40 and Col. 10 lines 31-33) and the use of a pilot reference signal for phase matching (Col. 4 lines 5-14) between the traffic channel and the reference signal (Col. 10 lines 24-67), wherein the pilot signal is wider than the beam width of the traffic beam. (Fig. 3 [301 & 311-313] and Col. 9 lines 36-46) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the wireless network of Scherzer in view of Judson after modifying it to incorporate the pilot signal width of Scherzer et al. One of ordinary skill in the art would have been motivated to do this since the traffic beam carries more information and can be the source of more interference; so focusing the beam's direction can limit interference sources.

Regarding claim 19, the limitations of claim 19 are rejected as being the same reasons set forth above in claim 4.

Regarding claim 33, the limitations of claim 33 are rejected as being the same reason set for the above in claims 3 & 4.

7. Claims 8 & 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Scherzer in view of Judson as applied to claims 1 and 16 above, and further in view of Love (US-6,148,208).

Regarding claim 8, Scherzer in view of Judson teaches the limitations of claim 1 above, but differs from the claimed invention by not explicitly reciting the power control signal comprises a digital gain unit.

In an analogous art, Love teaches power control in a communication system that includes a power control signal that comprises digital gain units. (Col. 7 lines 24-44) At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement the communication system of Scherzer in view of Judson after modifying it to incorporate the power control signal of Love. One of ordinary skill in the art would have been motivated to do this since the power control signals allows maintaining an acceptable quality of service while using a minimum amount of transmission power. (Love Col. 1 lines 41-62)

Regarding claim 23, the limitations of claim 23 are rejected as being the same reason set forth above in claim 8.

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **MATTHEW SAMS** whose telephone number is (571)272-8099. The examiner can normally be reached on M-F 8-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lester Kincaid can be reached on (571) 272-7922. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW SAMS/
Examiner, Art Unit 2617

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Supervisory Patent Examiner, Art Unit 2617